could build up an agriculture that would be not only profitable but also permanent and increasingly productive.

E. Davenport

SCIENTIFIC EVENTS

ATOMIC ENERGY

At the second day of the James Watt centenary commemoration at Birmingham those present heard an address by Sir Oliver Lodge foreshadowing the possible employment of atomic energy.

According to the report in the London *Times* Sir Oliver Lodge said that, in view of the fact that the sources of molecular energy are beginning to show signs of exhaustion, he ventured to assume that if James Watt were living to-day he would be directing his attention to discovering whether there are other stores of energy at present almost unsuspected. The fact was that contained in the properties of matter there was an immense source of energy so far inaccessible, but which he saw no reason why the progress of discovery should not make available. He referred to atomic energy which, if it could be utilized on an extensive scale, would, he believed, greatly ameliorate the conditions of factory life. There would be no smoke due to imperfect combustion and no dirt due to the transit of coal or ashes, while the power would be very compact and clean. Possibly there might occasionally be explosions due to the liberation of power more quickly than it was wanted, but in general he presumed that the conditions of utilization would be good.

Sir Oliver explained that the secret of this power began to be given away when radio-activity was discovered, and said that at present we were hardly at the beginning of its utilization. The discovery of radium, which soon followed, excited universal interest and aroused great surprise, because radium appeared to give off energy continually without being consumed. The truth was that it did disappear as it gave off its energy, but the disappearance was so slow and the energy given off so remarkable that it was not surprising that one was noticed before the other. The energy of radium, however, was not under control, and it went on emitting energy at its own proper rate without regard to accidental circumstances. What happened was that every now and then a particle was projected. The energy stored in an atom was something enormous, and if we could make the atoms fly off when we wanted there would be available a source of energy which would put everything else into the background. This energy was contained in all forms of mater and was not confined to radio-active substances. If a stimulus could be found the utilization of this source of energy would be possible. We appeared to be on the verge of utilizing a minute fraction of it, and it was this energy which had made wireless telephony possible.

STATISTICS OF THE NATURAL GAS INDUSTRY

A report on "Natural Gas and Natural Gasoline in 1917" by John D. Northrop, just published by the Geological Survey, gives statistics of the production and consumption of natural gas and sketches the condition of the industry in 25 states. It gives also statistics concerning gasoline made from natural gas in that year.

More than 2,100 cities and towns in the United States are supplied with natural gas, which is furnished to domestic consumers at rates that should arouse the envy of those consumers of artificial gas who have to pay about a dollar a thousand cubic feet. The average price per thousand cubic feet charged to consumers of natural gas in the United States in 1917 was about 30 cents. The average price charged to manufacturers was less than 12 cents.

Most of the towns and cities supplied with natural gas are in New York Pennsylvania, Ohio, West Virginia, Kansas, Oklahoma and California. In Ohio 872,000 domestic consumers were supplied in 1917, In Pennsylvania 480,000, in California 239,000, in Kansas 188,000, in New York 164,000, in West Virginia 129,000, and in Oklahoma 95,000. The industrial consumers, by whom the gas is used for manufactures or for generating power, use twice as much gas as the domestic users.

The recovery of gasoline from natural gas has now become a large industry, which contributes materially to the supply of motor fuels. Experiments in the conversion of natural gas to gasoline were made as early as 1903, but experiment did not give way to commercial production until about 1910. The growth of the industry since that year has been remarkable. In 1911 there were in operation 176 plants, which produced about 7,400,000 gallons of raw gasoline from natural gas. In 1917, only six years later, there were 886 plants, which produced nearly 218,000,000 gallons. Prior to 1916 most of the gasoline recovered from natural gas was derived from casing-head gas obtained from oil wells, by methods involving compression and condensation, but from year to year an increasingly large proportion of the annual output of natural-gas gasoline has been recovered by the absorption process, which has now been applied not only to "wet" gas from oil wells but also to so-called "dry" gas, which occurs independent of oil and constitutes the main supply of natural gas. Dry gas can not be profitably converted into gasoline by compression.

LEATHER FROM AQUATIC ANIMALS

THE Bureau of Fisheries reports that excellent progress in the tanning of fish leather is to be recorded, and a number of the difficulties that have retarded the development of the industry have been overcome by tanners in this field.

One company which is tanning fish-skins has established a station in North Carolina and another in Florida for the capture of sharks and porpoises, and is meeting with success in its fishery for sharks. It is understood that the number of stations will be increased as rapidly as possible. Another company which has recently acquired a site for a tannery in Washington plans to tan the hides of sharks, beluga, hair seals, etc.

Samples of leather recently submitted show marked improvement in appearance over earlier samples. The leather is soft and pliable and appears to have ample strength for many uses. Arrangements have been perfected for the Bureau of Standards to make tests of later products as to durability, porosity, tensile strength, pliability, water absorption, wearing qualities, etc.

The nets which the Bureau developed for the capture of sharks are proving successful and are being adopted for the fishery. At the fishery stations the liver oil is extracted and the flesh is converted into fertilizer, so that none of the material is wasted.

The supplies of walrus leather, which is cut into wheels and used for polishing fine metal surfaces or for removing mars and scratches on bright metal objects, have heretofore been imported. Last year the bureau furnished several interested persons with pieces of walrus hides for tanning and has recently received a sample of leather made therefrom for which tests are being arranged to determine its suitability for such purposes.

VACATION NATURE STUDY

BELIEVING that a better knowledge of wild life will bring about better conservation of it, and that when people are on their summer vacations they are most responsive to education on wild life resources, the California Fish and Game Commission backed by the California Nature Study League instituted this past summer a series of lectures and nature study field trips designed to stimulate interest in the proper conservation of natural resources. Six different resorts in the Tahoe region were selected for the work, and here illustrated lectures on the game birds, song birds, mammals and fish, given by Dr. Harold C. Bryant, of the University of California, furnished evening entertainment and early morning trips afield gave visitors an introduction to mountain wild life.

The motto of the field classes was: "Learn to read a roadside as one reads a book." Special excursions for children gave surprising results owing to the rapidity with which they absorbed information about the living things encountered.

Compact nature study libraries were placed at the resorts by the California Nature Study League and an exhibit of colored pictures and other illustrated material was on display.